5 May 1977

MEMORANDUM FOR THE RECORD

SUBJECT: Reduction of Field Station Equipment Inventory

1. It would appear that we should adopt an OC objective
to reduce the amount of equipment in field stations to the
greatest degree possible as our system evolves. Prudent
planning should allow for equipment reductions while retain-
ing the capability to operate both on-line and off-line
circuits and utilizing both satellite and HF transmission
modes. The following questions, which by no means originate
with the writer, are posed as possible approaches to reduce
equipment and simplify field station operations and maintenance:

   a. Could the SKYLINK terminal and the PRS HF
   capability be combined into one carrier capability?
   This approach would allow for the utilization of
   SKYLINK as a primary mode and a conversion to HF
   without a change of operational capabilities, e.g.,
   SKYMUX via both satellite and HF. Specifically could
   the existing equipment be used in the following manner?

      1) Could we use the SKYLINK synthesizer as a
      frequency standard for HF operations thus elimina-
      ting the HF exciter? Obviously, some mechanism
      would have to be employed to produce frequency
      products in the 3 to 30 MHz range and some filtering
      would be required to eliminate unwanted products.
      The synthesizer output would be used to drive the
      HFL-1000 or eventually a broad band amplifier which
      would eliminate tuning requirements.

      2) Could the SKYLINK terminals coder and decoder
      be used to enhance HF operations thus eliminating
      the need for Barry Research modums, etc.

      3) Do we need a morse only transmitter in SKYLINK
      field stations since we have two higher powered
      standby transmitters and an off-station package for
      last resort use?

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     b. Could we eventually utilize one series of crypto equipment for both on-line data and secure voice operations and then utilize the same device for off-line operations? (OTP would serve for emergency communications if key was compromised for the primary system.)

     1) Could the KW-7 be used for off-line encipherment, thus eliminating the requirement for the HW-28 or its successor?

     2) Could key generators such as the KG-13 or KG-84 be used in an off-line mode?

     3) Can we adopt a single cryptographic system which will serve both data and secure voice needs?

     c. In the area of terminal equipment, do we require multiple devices of similar design to perform various tasks? Could a standard series of peripheral equipments, tied together with a controller or concentrator, be adopted to meet a variety of needs? Elements of the total system would only be issued as required to meet customer demands or relieve workloads. A standard line of microprocessors could then serve to perform individualized internal data handling and buffering tasks, to provide transmission line protocols, etc.

     1) Could one magnetic tape storage device be adopted for message storage purposes, data transfers and for FSUO purposes?

     2) Do we need a word processor based upon a VDU and could most of our format requirements be incorporated into the logic of the device?

     3) Could the word processor mentioned above be extended to the customer's office, thus eliminating the need for an OCR?

     4) Would one standard printer which operates at various print rates satisfy all of our requirements?

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    5) How long will we require a paper tape capability? Can this requirement, assuming that it is presently small, secondary and deminishing, be satisfied with add on, inexpensive paper tape punches and readers where required?

    6) Can CSR and MRS requirements be met with the standard microprocessor mentioned above?

  d. Field station paper in the form of chronological files and logs must also be addressed if the objective of simplifying field station installations is adopted. How much of our budgetary and human resources are now or will be spent to continue to simulate torn tape operations or to store records which are already retained in automated systems such as MAX or CDS?

    1) What would AFT look like if the message accounting, formatting and storage functions were accomplished at a central location?

    2) Should we continue to exchange traffic in torn tape format or could we convert to a data handling system with accountability and document reconstruction processes handled by machines?

    3) Should OC retain chronological files after the information has been successfully introduced into an automated switch?

    4) If we convert to a data system, should OC or the customer handle input and output, e.g. does CRAFT represent the transfer of a function which should be retained by OC?

    5) Could field stations be viewed in the future as ports off of an enlarged or separate CDS system.

  2. Obviously, network design efforts cannot be based upon the foregoing. However, there is an abundance of talent within OC which can design the network once the broad objectives have been established. Two such objectives might be to select multipurpose field equipment whenever possible in order to reduce the equipment inventory and to reduce the field station accounting and message handling steps to the barest minimum by centralizing these processes.

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